Amendments to the Claims:

This listing of claims will replace all prior versions and listings, of claims in this application:

Listing of Claims:

1. (Currently Amended) An electrical assembly for use in an electrical system in which arcing can occur during ~~mating or~~ unmating of two matable parts of an electrical connector connectable between a source and a load, each mating part comprising separable terminals positioned within separable housings, the electrical assembly comprising the electrical connector and a solid state relay, wherein the electrical connector is connected to the solid state relay so that the solid state relay shifts to an open state, disconnecting the source from the load through the relay, ~~during mating or~~ after commencement of unmating of the electrical connector, but prior to initiation of arcing between the two parts of the electrical connector ~~assembly~~.

2. (Original) The electrical assembly of claim 1 in which the solid state relay includes a power MOSFET comprising a primary switching member, the power MOSFET switching between ON and OFF states without arcing to which an electromechanical relay would be subject.

3. (Currently Amended) An electrical system including an electrical connector and a solid state relay attached to the connector to prevent arcing when mating contacts in the electrical connector are disconnected, the electrical system comprising:

the electrical connector including first mating contact means ~~and~~ second mating contact means, first contact means in one electrical connector housing being joined to second contact means in the same housing, the

first mating contact means ~~have~~ having sufficient current carrying capacity to carry the entire current through the connector, the second mating contact means being disconnectable prior to disconnection of the first mating contact means;

the solid state relay including a power MOSFET, the second mating contact means being connected to the solid state relay so that the power MOSFET is switched off when the second mating contact means are disconnected but prior to disconnection of the first mating contact means so that no current is carried by the first mating contact means when the first mating contact means are disconnected.

4. (Original) The electrical system of claim 3 wherein the first mating contact means comprises first mating pin and receptacle contacts and the second mating contact means comprises second mating pin and receptacle contacts, the second mating pin contacts being shorter than the first mating pin contacts so that the second mating contact means is disconnected prior to disconnection of the first mating contact means as the electrical connector is unmated.

5. (Original) The electrical system of claim 3 wherein the second mating contact means comprises a shunt engaging one contact terminal matable with a second contact terminal to form the first mating contact means, the shunt being disengaged from the one contact terminal before the one contact terminal is unmated from the second contact terminal as the electrical connector is unmated.

6. (Currently Amended) The electrical system of claim 3 wherein disconnection of the second contact means disconnects the MOSFET drain from a sense circuit to

charge up the MOSFET gate voltage to the MOSFET source voltage to turn the MOSFET to an OFF state.

7. (Original) The electrical system of claim 3 wherein the solid state relay floats relative to ground when the power MOSFET is off, to eliminate leakage current between a battery and ground.

8. (Original) The electrical system of claim 3 wherein the solid state relay is connected between a positive battery terminal and a load.

9. (Original) The electrical system of claim 3 wherein current through the power MOSFET is turned on by an active low gate input.

10. (Original) The electrical system of claim 9 wherein the relay includes a monitoring circuit connected to monitor the voltage drop between source and drain of the power MOSFET, an increase in the source - drain voltage drop, above a reference voltage, resulting in a high signal at the gate to turn the power MOSFET off.

11. (Original) The electrical system of claim 3 wherein the second contact means is at a voltage substantially equal to a voltage at the drain of the power MOSFET, when the second contact means are in a mated configuration.

12. (Original) The electrical system of claim 3 including multiple parallel power MOSFET's.

13. (Currently Amended) A solid state relay comprising:

a power MOSFET for switching current to a load, the MOSFET including a source, a gate and a drain;

the gate comprising an active low gate for controlling source to drain current through the power MOSFET, the power MOSFET being isolated from ground potential except through the gate when the solid state relay is connected between a positive battery voltage and a load; and

a circuit for applying a gate input to shut off source to drain current through the MOSFET when a voltage drop between the MOSFET source and drain exceeds a reference voltage; wherein the circuit and the active low gate are configured to float in the absence of an active low input to the gate, and are not tied to ground, to prevent leakage when the power MOSFET is commanded to a nonconducting state OFF state by removal of an low gate input.

14. (Original) The solid state relay of claim 13 wherein the circuit for applying a gate input to shut off source to drain current comprises a bipolar transistor that turns on to shut off source to drain current when the voltage drop between the MOSFET source and drain exceeds a reference voltage.

15. (Original) The solid state relay of claim 14 wherein the bipolar transistor includes an emitter base junction that monitors the voltage drop between the MOSFET source and drain.

16. (Original) The solid state relay of claim 15 wherein the emitter base junction is biased by a diode and resistance between the MOSFET drain and the bipolar transistor base, by a resistance between the MOSFET source and the bipolar transistor base and by a resistance between the diode and the MOSFET gate.

17. (Original) The solid state relay of claim 16 including a disconnectable contact between the MOSFET drain and the bipolar transistor base, disconnection of the disconnectable contact from a load turning the bipolar transistor ON and the power MOSFET off.

18. (Withdrawn) A solid state Form A relay including a first relay terminal (30) connectable to a high battery voltage potential, a second relay terminal (87) connectable to the high side of a load, and a third relay

terminal (86) comprising a signal input terminal, the solid state Form A relay including circuitry comprising:

a power MOSFET having a source connected to the first relay terminal (30) and a drain connected to the second relay terminal (87);

the power MOSFET including a gate connected to the third relay terminal (86), the power MOSFET being turned to an On state by an active low input applied to the third relay terminal (86);

a pull up resistor connected between the first and third relay terminal (30 and 86);

a voltage sensing circuit comprising means for sensing source-drain voltage drop when the power MOSFET is in an ON state, the voltage sensing circuit being connected to the gate so that when the source-drain voltage drop exceeds a reference level, the power MOSFET is turned to an OFF state; and

the solid state Form A relay circuitry floating relative to ground potential when the active low input is removed from the third terminal (86) so that leakage current between a high battery voltage potential and a ground voltage potential is eliminated when the power MOSFET and the solid state form A relay are commanded to an OFF state by the absence of an active low input at the third relay terminal (86).

19. (Withdrawn) The solid state Form A relay of claim 18 wherein the first, second, and third relay terminals are configured in a standard electromechanical relay pin configuration so that the solid state Form A relay can be substituted for a standard electromechanical relay without introducing a leakage path across the solid state Form A relay when the solid state Form A relay is commanded to an OFF state.

20. (Withdrawn) The solid state Form A relay of claim 19 wherein the first, second, and third relay terminals are configured in a standard ISO 7588-2 mini relay pin configuration.

21. (Withdrawn) The solid state Form A relay of claim 19 wherein the first, second, and third relay terminals are configured in a standard mini SAE J1744 relay pin configuration.

22. Withdrawn) The solid state Form A relay of claim 18 including an additional relay terminal (85) connectable to a ground voltage potential and a zener diode connected between the first and the additional relay terminals.

23. (Withdrawn) The solid state Form A relay of claim 22 including a free wheeling diode connected between the second and the additional relay terminals.

24. (Withdrawn) The solid state Form A relay of claim 18 including an additional relay terminal, the additional relay terminal being unconnected to any circuitry in the solid state Form A relay, wherein the first, second, third and the additional relay terminals are configured in a standard electromechanical relay pin configuration so that the solid state Form A relay can be substituted for a standard electromechanical relay without introducing a leakage path across the solid state Form A relay when the solid state Form A relay is commanded to an OFF state.

25 (Withdrawn) A solid state relay including a first relay terminal (30) connectable to a high battery voltage potential, a second relay terminal (87) connectable to the high side of a load, a third relay terminal (86) comprising a signal input terminal, and a fourth relay terminal (87a) comprising a voltage sense pin, the solid state relay including circuitry comprising:

a power MOSFET having a source connected to the first relay terminal (30) and a drain connected to the second relay terminal (87) and the fourth relay terminal (87a);

the power MOSFET including a gate connected to the third relay terminal (86), the power MOSFET being turned to an On state by an active low input applied to the third relay terminal (86);

a pull up resistor connected between the first and third relay terminal (30 and 86);

a voltage sensing circuit comprising means for sensing source-drain voltage drop when the power MOSFET is in an ON state, the voltage sensing circuit being connected to the gate so that when the source-drain voltage drop exceeds a reference level, the power MOSFET is turned to an OFF state;

the fourth relay terminal (87a) being connected to the voltage sensing circuit so that upon disconnection of the fourth relay terminal (87a) from a voltage at the second relay terminal, the power MOSFET is turned to the OFF state; and

the solid state relay circuitry floating relative to ground potential when the active low input is removed from the third terminal (86) so that leakage current between a high battery voltage potential and a ground voltage potential is eliminated when the power MOSFET and the solid state relay are commanded to an OFF state by the absence of an active low input at the third relay terminal (86).

26. (Withdrawn) The solid state relay of claim 25 wherein the first, second, third and fourth relay terminals are configured in a standard electromechanical relay pin configuration so that the solid state relay can be substituted for a standard electromechanical relay

without introducing a leakage path across the solid state relay when the solid state relay is commanded to an OFF state.

27. (Withdrawn) The solid state relay of claim 26 wherein the first, second, third and fourth relay terminals are configured in a standard ISO 7588-2 mini relay pin configuration.

28. (Withdrawn) The solid state relay of claim 26 wherein the first, second, third, and fourth relay terminals are configured in a standard mini SAE J1744 relay pin configuration.